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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/735,732 | 12/16/2003 | Atsushi Tokuda | 740756-2684 | 3635 |

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| EXAMINER | |
|---|---|
| GARRETT, DAWN L | |
| **ART UNIT** | **PAPER NUMBER** |
| 1774 | |

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|---|---|
| 06/15/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/735,732 | TOKUDA ET AL. | |
| | Examiner | Art Unit | |
| | Dawn Garrett | 1774 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *28 March 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *7-27-04* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

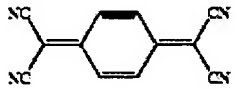
**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

1. This Office action is responsive to the amendment filed March 28, 2007. Claim 1 was amended. Claims 16-19 are canceled. The species under consideration remain as the following: Polythiophene as the conjugate polymer and Formula (2) as the electron-accepting compound.




(2)

Claims 1-15 read upon the elected species and are currently under consideration.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. The rejection of claims 1-7 and 13-15 under U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Heuer et al. (US 6,368,731) is withdrawn.

4. The rejection of claims 8-11 under 35 U.S.C. 103(a) as obvious over Heuer et al. (US 6,368,731) in view of Yang et al. (US 5,723,873) is withdrawn.

5. The rejection of claim 12 under 35 U.S.C. 103(a) as obvious over Heuer et al. (US 6,368,731) in view of Ara (US 6,613,454) is withdrawn.

6. Claims 1-7 and 13-15 are rejected under 35 U.S.C. 103(a) as obvious over Heuer et al. (US 6,368,731) in view of Lidberg et al. Proceedings of SPIE - The International Society for Optical Engineering (1995), 2397 (Optoelectronic Integrated Circuit Materials, Physics, and Devices), p. 633-42. Heuer et al. teaches electroluminescent assemblies comprising a substrate, an anode, an electroluminescent element and a cathode (see abstract). The electroluminescent element contains one or more zones selected from the group consisting of hole injection zone,

hole transport zone, electroluminescent zone, electron transport zone, and electron injection zone (see abstract). Heuer et al. teaches the hole injection zone is preferably comprised of an uncharged or cationic polythiophene (see col. 2, lines 32-56). The polythiophenes are used in the cationic form by treatment of neutral thiophenes with oxidizing agents (see col. 11, lines 17-21). Heuer et al. does not teach specifically that the oxidizing agents remain with the polythiophene in the final device. Lidberg et al. teaches polythiophenes doped with electron acceptors such as 7,7,8,8-tetracyanoquinodimethane (TCNQ) as oxidized conductive polymers (see abstract, Figure 1, and page 635, first line of first paragraph under 2.1 heading). The oxidized polymers are taught to be applicable to applications such as light emitting diodes (see page 633, second and third lines of text under "Introduction" heading). Lidberg et al. further teaches doping a polythiophene with the dopants such as TCNQ provides the benefit of increased charge-carrier mobility and increased electrical conductivity (see paragraph under "Fig. 2" on page 635). It would have been obvious to one of ordinary skill in the art to have selected the oxidized polythiophenes taught by Lidberg et al. for the Heuer et al. device, because Lidberg teaches the doped polythiophenes are suitable for a light emitting diode and provide increased conductivity compared to undoped polythiophene. Claims 13 and 14 are considered to be product-by-process type claims and Heuer et al. is deemed to disclose the final product as required (see MPEP 2113).

7. Claims 8-11 are rejected under 35 U.S.C. 103(a) as obvious over Heuer et al. (US 6,368,731) in view of Lidberg et al. Proceedings of SPIE - The International Society for Optical Engineering (1995), 2397 (Optoelectronic Integrated Circuit Materials, Physics, and Devices), p. 633-42 in further view of Yang et al. (US 5,723,873). Heuer et al. and Lidberg are relied upon as

set forth above. Heuer et al. teaches the zone or zones located between the hole injection zone and the cathode can also assume a plurality of functions, i.e. one zone can contain, for example, hole-injecting, hole-transporting, electroluminescent, electron-transporting and/or electron injecting substances (see col. 2, lines 63-67). Yang et al. teaches in analogous art "electron injection layer" and "hole blocking layer" are synonymous terms used in the art (see col. 16, line 2). It would have been obvious to one of ordinary skill in the art at the time of the invention to have included an electron injection zone (hole blocking layer) in the Heuer et al. device, because Heuer et al. teaches such a functional zone may be included in the device.

8. Claim 12 is rejected under 35 U.S.C. 103(a) as obvious over Heuer et al. (US 6,368,731) in view of Lidberg et al. Proceedings of SPIE - The International Society for Optical Engineering (1995), 2397 (Optoelectronic Integrated Circuit Materials, Physics, and Devices), p. 633-42 in further view of Ara (US 6,613,454). Heuer et al. and Lidberg are relied upon as set forth above. Heuer et al. teaches inclusion of a light emitting material in the electroluminescent layer (see col. 21, lines 16-19 and col. 21, lines 47-53), but fails to disclose specifically a triplet-excitation type light emitting material. Ara teaches in analogous art the use of light emitting layers for electroluminescent devices exhibiting triplet-excitation (see col. 7, lines 38-45). It would have been obvious to one of ordinary skill in the art at the time of the invention to have selected a light emitting layer exhibiting triplet excitation as taught by Ara for the light emitting layer (electroluminescent layer) of the Heuer et al. device, because Ara teaches such a layer is known in the art and one would expect the light emitting layer material to be similarly useful as light emitting material in the Heuer et al. device.

***Response to Arguments***

9. Applicant's arguments filed March 28, 2007 have been fully considered but they are not persuasive.

With regard to the prior rejections over Heuer et al. in view of Lidberg et al., applicant argues Heuer et al. does not teach every feature of the claims. The examiner submits the secondary reference, Lidberg et al. is provided to teach it is obvious to include a dopant such as TCNQ in polythiophene in order to improve charge carrier mobility and increase electrical conductivity. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

With regard to the combination of Heuer et al. and Lidberg et al., applicant argues there is no motivation to combine Lidberg and Heuer, the motivation for combining is too general, and the motivation for combining was arrived at by hindsight reasoning. The motivation for combining has been specifically set forth by the examiner in the rejection and these arguments. Furthermore, in response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In response to applicant's argument that there is no suggestion to

combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Lidberg et al. is provided to teach it is obvious to include a dopant such as TCNQ in polythiophene in order to improve charge carrier mobility and increase electrical conductivity of polythiophene.

***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dawn Garrett whose telephone number is (571) 272-1523. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached at (571) 272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dawn Garrett
Primary Examiner
Art Unit 1774